

TechLines

Technical Information Sheet

EPP6

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The Mystery of Dot Gain Explained!

Everything you wanted to know about Dot Gain but were afraid to ask!

Dot Gain (also known as Tone Value Increase [TVI] in recent industry publications) is a phenomenon in offset lithography where the dots that make up halftones, 4/color separations and screen tints increase in size. It is composed of two elements.

Mechanical (physical) gains: occur during film generations, conventional platemaking, ink, paper and press/printing conditions. Computer-to-plate technology eliminates a portion of expected gain.

Optical (visual) gains: due to interaction between light and ink on paper. As refracted light enters the paper around and into the dots, the light that reflects back to the eye artificially increases the diameter of the dot, making it appear larger than it really is.

Dot gain as related to dot percentage: the greatest amount of dot gain occurs right in the midtone of halftones and tint screens of 30% to 70%.

A Dot Gain Story...

Once upon a press startup, as press personnel increase the amount of ink on the form to improve the appearance of solid blocks and type, the halftone and tint screen dots around 50% are also increasing. In reviewing their work, the crew sees that the screens are beginning to “plug up” – dots are gaining in size resulting in a mottled appearance. But at the same time, the solid areas are printing at desired target ink density.

What would the customer prefer? Nice black solids and type? Halftones that are sharp and show their details? Screens that are clean?

A decision is made – based on content of the job and the intended audience – that halftone reproduction is far more important so ink density is reduced and strong solids are sacrificed. In their attempt to accurately reproduce the halftones – a very important consideration in a book catalog or college alumni publication – will they have a disappointed customer? Will the press crew and customer live happily everafter?

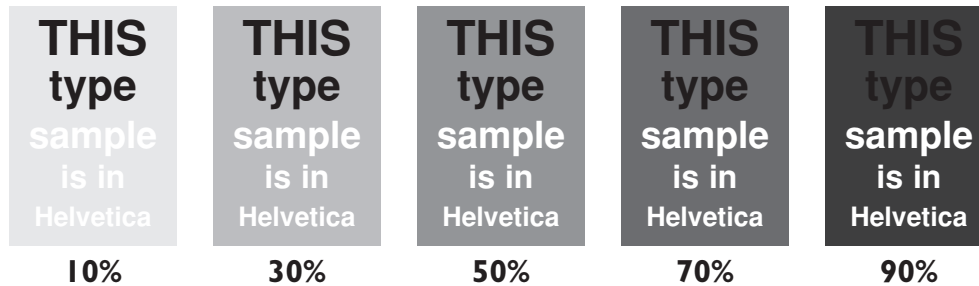
Dot gain as related to line screen: the larger the line screen, the more it is susceptible to dot gain.

Dot gain as related to solid ink density: as the amount of ink being placed on paper increases, dot size also increases.

Dot gain as related to press equipment: since dot gain is affected by ink, paper and press equipment, it is important to question your printer about their dot gain requirements.



120 LINE SCREENS



Adjustments and further considerations...

- Contact your printer for their specific dot gain allowances.
- Adhere to the printer's recommended line screens – they have been determined based on print conditions, press equipment and paper characteristics.
- If you are creating electronic files, use dot gain settings based on information from the printer or use the print condition selections available in many applications.
- Halftones need to be adjusted for the effects of dot gain. Be aware of the print conditions and set the dot gain in Adobe Photoshop accordingly, using information from your printer or print condition selections in software applications.
- When placing solid color type in a same color tint screens (or black type in gray screens) we recommend that the screen value not exceed 30%.
- On covers with large solids and smaller areas of screens, the screens should be less than 50% to maintain a distinction between the two elements.

Dot gain allowances at Ripon Printers based on press, stock and preferred line screens

Press/stock	Line Screen	Dot Gain
Sheet/coated – 4/color	175	15%
Sheet/coated – tints only	133	15%
Sheet/uncoated – 4/color	133	20%
Sheet/uncoated – tints only	120	20%
Heatset Web/#1 & #2 coated	175	19%
Heatset Web/#3 coated	150	19%
Heatset Web/#4 & #5 coated groundwood	150	19%
Heatset Web/super calendered	133	22%
Heatset Web/uncoated offset	133	30%
Coldset Web/offset	133	30%
Coldset Web/groundwood	120	30%
Coldset Web/newsprint	100	30%